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TITLE: Coating composition for undercoating, contains organosilane, the hydrolyzed product and/or condensate of the organosilane, water and/or organic solvent, silica and/or alumina, and semiconductor particles

PATENT-ASSIGNEE: JSR CORP[JAPS]

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ABSTRACTED-PUB-NO: JP2000290589A

BASIC-ABSTRACT:

NOVELTY - A coating composition contains an organosilane, the hydrolyzed product and/or the condensate of the organosilane, water and/or an organic solvent, silica and/or alumina, and semiconductor particles having UV ray absorption.

DETAILED DESCRIPTION - A coating composition contains:

(a) at least one selected from an organosilane, the hydrolyzed product of the organosilane, and the condensate of the organosilane;

(b) water and/or an organic solvent;

(c) silica and/or alumina; and

(d) semiconductor particles having ultraviolet ray absorption.

The organosilane of formula $(R1)_nSi(OR2)_{4-n}$ (I) is new.

R1 = 1-8C monovalent organic group;

R2 = 1-5C alkyl, or 1-6C acyl;

n = 0-2.

USE - The coating composition finds its application in undercoating.

ADVANTAGE - The coating composition has superior shelf life stability, external appearance in a coating, adhesion, and weather resistance, and high hardness. The use of the semiconductor particles having ultraviolet ray absorption prevents a bed or a substrate from deterioration. The use of the coating composition for an undercoating layer enhances adhesion between a base material and an overcoating layer, and prevents the base material from deterioration.

CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS: COATING COMPOSITION UNDERCOAT CONTAIN PRODUCT CONDENSATE WATER ORGANIC SOLVENT SILICA ALUMINA SEMICONDUCTOR PARTICLE

DERWENT-CLASS: A82 E11 G02

CPI-CODES: A08-M09C; A08-R06A; A08-R06B; A12-B01C; E05-E02; E05-E03; E31-P03; E34-C02; G02-A05E;

CHEMICAL-CODES:

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Notes:

1. Untranslatable words are replaced with asterisks (****).
2. Texts in the figures are not translated and shown as it is.

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[Claim(s)]

[Claim 1] (a) the following general formula (1)

$(R1)_n Si(OR2)_{4-n} \dots (1)$

([among a formula, two R1 is the same or different, when it exists, and the univalent organic group of carbon numbers 1-8 is shown, and / R2]) It is the same or different and the alkyl group of carbon numbers 1-5 or the acyl group of carbon numbers 1-6 is shown. n is the integer of 0-2. At least one sort chosen from the group of the hydrolysis thing of ORGANO Silang and this ORGANO Silang, and the condensation thing of this ORGANO Silang expressed, (b1) The coating constituent characterized by containing the particulates of a semiconductor which have water and/or the organic solvent, (c) silica and/or alumina, and (d) ultraviolet absorption ability.

[Claim 2] (a) The following general formula (1)

$(R1)_n Si(OR2)_{4-n} \dots (1)$

([among a formula, two R1 is the same or different, when it exists, and the univalent organic group of carbon numbers 1-8 is shown, and / R2]) It is the same or different and the alkyl group of carbon numbers 1-5 or the acyl group of carbon numbers 1-6 is shown. n is the integer of 0-2. At least one sort chosen from the group of the hydrolysis thing of ORGANO Silang and this ORGANO Silang, and the condensation thing of this ORGANO Silang expressed, (b2) Kay who combined with the hydrolysis nature machine and/or the hydroxyl group -- base -- the coating constituent characterized by containing the particulates of a semiconductor which have the polymer containing the silyl machine which has an atom, (c) silica and/or alumina, and (d) ultraviolet absorption ability.

[Claim 3] The coating constituent according to claim 1 or 2 which is a coating constituent for the coating under a paint.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] About a coating constituent, still in detail, this invention contains the semiconductor ingredient which has ultraviolet absorption ability, and relates to a coating constituent suitable as a coating constituent for bottom coating.

[0002]

[Description of the Prior Art] The ORGANO Silang system coating material is a coating material excellent in weatherability (light) nature, resistance to contamination, etc., and, moreover, is excellent in heat resistance, alkali resistance, organicity-proof medicine nature, moisture resistance, water resistance, insulation-proof, abrasion resistance, and damage resistance. There is much demand of the coating materials which are durable over a long period of time, and the thing aiming at protection of a ground or a substrate has increased also in it in recent years. By the way, the ORGANO Silang system coating material is excellent in weatherability as mentioned above. Since in other words it does not have absorption of ultraviolet rays, it is stable. However, by one side, a ground and a substrate may deteriorate and exfoliation, a crack, etc. may occur because ultraviolet rays penetrate. Moreover, although many coating constituents which blended the photocatalyst ingredient, coating constituents which have water repellence and oil repellency, etc. are proposed in recent years, if these coating constituents are directly applied to a base material, the long-term adhesion nature of a base material and a coat may be inadequate.

[0003]

[Problem(s) to be Solved by the Invention] This invention is made against the background of these problems. The purpose The ORGANO Silang ingredient, specific silica, and/or specific alumina, And contain the semiconductor ingredient which has ultraviolet absorption ability, and it excels in preservation stability. And the coating constituent which it excels in coat appearance, adhesion nature, weatherability, etc., and hardness is high, and it has ultraviolet absorption ability, and can prevent degradation of a ground and a substrate, Moreover, when it uses as a bottom coating layer, it is offering the coating constituent for bottom coating which improves the adhesion nature of a base material and finishing coat, and prevents degradation of a base material.

[0004]

[Means for Solving the Problem] This invention is the (a) following general formula (1).

(R1) $n \text{ Si}(\text{OR}_2)_{4-n} \dots (1)$

([among a formula, two R1 is the same or different, when it exists, and the univalent organic group of carbon numbers 1-8 is shown, and / R2]) It is the same or different and the alkyl group of carbon numbers 1-5 or the acyl group of carbon numbers 1-6 is shown. n is the

integer of 0-2. At least one sort chosen from the group of the hydrolysis thing of ORGANO Silang and this ORGANO Silang, and the condensation thing of this ORGANO Silang expressed, (b1) The coating constituent (henceforth "a constituent (I)") characterized by containing the particulates of a semiconductor which have water and/or the organic solvent, (c) silica and/or alumina, and (d) ultraviolet absorption ability is offered.

Moreover, this invention is the (a) following general formula (1).

(R1) $n \text{ Si}(\text{OR}_2)_{4-n} \dots (1)$

([among a formula, two R1 is the same or different, when it exists, and the univalent organic group of carbon numbers 1-8 is shown, and / R2]) It is the same or different and the alkyl group of carbon numbers 1-5 or the acyl group of carbon numbers 1-6 is shown. n is the integer of 0-2. At least one sort chosen from the group of the hydrolysis thing of ORGANO Silang and this ORGANO Silang, and the condensation thing of this ORGANO Silang expressed, (b2) Kay who combined with the hydrolysis nature machine and/or the hydroxyl group -- base -- the polymer containing the silyl machine which has an atom -- (c) Offer the coating constituent (henceforth "a constituent (II)") characterized by containing the particulates of a semiconductor which have silica and/or alumina, and (d) ultraviolet absorption ability. Furthermore, this invention offers the coating constituent for the coating under a paint which used the 1st constituent of the above, and the 2nd constituent.

[0005]

[Embodiment of the Invention] A constituent (I) constituent (I) makes the main ingredients the above-mentioned (a) ingredient, an ingredient (b1), the (c) ingredient, and the (d) ingredient. (a) ORGANO Silang where an ingredient; (a) ingredient is expressed with the above-mentioned general formula (1) (it is called the following "ORGANO Silang (1)"), It is at least one sort chosen from the hydrolysis thing of ORGANO Silang (1), and the condensation thing of ORGANO Silang (1), and the work as a binding material is carried out into the constituent of this invention. That is, at least one sort may be good, you may be two sorts of arbitrary mixtures, and the (a) ingredient may be a mixture which it is in these three sorts and included all three kinds.

[0006] Here, the hydrolysis thing of above-mentioned ORGANO Silang (1) is OR2 contained in 2-4 ORGANO Silang (1). You may be that into which all machines do not need to be hydrolyzed into, for example, only one piece is hydrolyzed, the things into which two or more pieces are hydrolyzed, or these mixtures. Moreover, although the Syros Knoll machine of the hydrolysis thing of ORGANO Silang (1) condenses the condensation thing of above-mentioned ORGANO Silang (1) and Si-O-Si combination is formed Although what all the Syros Knoll machines do not need to be condensing and some [few] Syros Knoll machines condensed in this invention differs from the grade of condensation, it is the concept which included the mixture etc.

[0007] In a general formula (1), it is R1. as a univalent organic group of carbon numbers 1-8 For example, a methyl group, an ethyl group, n-propyl group, i-propyl group, n-butyl group, i-butyl group, a sec-butyl group, t-butyl group, n-hexyl group, Alkyl groups, such as n-HEPUCHIRU machine, n-OKUCHIRU machine, and a 2-ethylhexyl machine; An acetyl group, A pro PIONIRU machine, a BUCHIRIRU machine, a valeryl machine, a benzoyl group, a bird oil machine, Acyl groups, such as a KAPUROIRU machine; A vinyl group, an allyl group, a cyclohexyl machine, a phenyl group, an epoxy group, a glycidyl group, an acrylics (meta) OKISHI machine, a UREIDO machine, an amide machine, a fluoro aceto amide machine, an isocyanate machine, etc. -- others -- the substitution derivative of these bases etc. can be mentioned.

[0008] R1 as a substituent in a substitution derivative For example, a halogen atom, substitution or an unsubstituted amino group, a hydroxyl group, a mercapto group, an isocyanate machine, a glycidoxy machine, 3, 4-epoxycyclohexyl machine, an acrylics (meta) OKISHI machine, a UREIDO machine, an ammonium salt machine, etc. can be mentioned. However, R1 which consists of these substitution derivatives A carbon number is eight or less including the carbon atom in a substituent. In a general formula (1), it is R1. When two pieces exist, it may be the same to mutual or you may differ in it.

[0009] Moreover, R2 as an alkyl group of carbon numbers 1-5 For example, a methyl group, an ethyl group, n-propyl group, i-propyl group, n-butyl group, A sec-butyl group, t-butyl group, n-Penn Chill machine, etc. can be mentioned, and an acetyl group, a pro PIONIRU machine, a BUCHIRIRU machine, a valeryl machine, a KAPUROIRU machine, etc. can be mentioned as an acyl group of carbon numbers 1-6, for example. R2 which exists in a general formula (1) It may be the same to mutual or you may differ in it.

[0010] As such an example of ORGANO Silang (1) Tetra-methoxysilane, tetra-ethoxy SHIRAN, tetra n-propoxysilane, Tetra-alkoxysilane, such as tetra i-propoxysilane and tetra n-butoxysilane; Methyl trimethoxysilane, MECHIRU triethoxysilane, ethyltrimethoxysilane, ethyltriethoxysilane, n-propyltrimethoxysilane, n-pro pill triethoxysilane, i-propyltrimethoxysilane, i-pro pill triethoxysilane, n-butyltrimethoxysilane, n-butyltriethoxysilane, n-pliers RUTORI methoxysilane, n-HEKISHIRU trimethoxysilane, n-heptyl trimethoxysilane, n-OKUCHIRU trimethoxysilane, vinyltrimethoxysilane, vinyltriethoxysilane, Cyclohexyl tri-methoxy silane, cyclohexyl ethoxy silane, Phenyltrimethoxysilane, phenyltriethoxysilane, 3-chloropropyltrimethoxysilane, 3-chloropropyl triethoxysilane, 3 and 3, 3-trifluoropropyl trimethoxysilane, 3 and 3, 3-trifluoropropyl triethoxysilane, 3-aminopropyl trimethoxysilane, 3-aminopropyl triethoxysilane, 2-hydroxyethyl trimethoxysilane, 2-hydroxyethyl triethoxysilane, 2-hydroxypropyl trimethoxysilane, 2-hydroxypropyl triethoxysilane, 3-hydroxypropyl trimethoxysilane, 3-hydroxypropyl triethoxysilane, 3-MERUKAPUTO propyltrimethoxysilane, 3-MERUKAPUTO pro pill triethoxysilane, 3-isocyanate propyltrimethoxysilane, 3-isocyanate pro

pill triethoxysilane, 3-glycidoxypentyltrimethoxysilane, 3-glycidoxypentyltriethoxysilane, 2-(3, 4-epoxycyclohexyl) ethyltrimethoxysilane, 2-(3, 4-epoxycyclohexyl) ethyltriethoxysilane, 3-(meta) acrylics OKISHI propyltrimethoxysilane, 3-(meta) acrylics OKISHIPURO pill triethoxysilane, Trialkoxysilane, such as 3-UREIDO propyltrimethoxysilane and 3-UREIDO pro pill triethoxysilane; dimethyldimethoxysilane, JIMECHIRU diethoxysilane, Diethyldimethoxysilane, diethyldiethoxysilane, G n-propyl dimethoxysilane, Di-n-propyl diethoxysilane, G i-propyl dimethoxysilane, G i-propyl diethoxysilane, di-n-butyl dimethoxysilane, Di-n-butyl diethoxysilane, G n-pen CHIRUJI methoxysilane, G n-PENCHIRU diethoxysilane, G n-HEKISHIRU dimethoxysilane, G n-HEKISHIRU diethoxysilane, G n-heptyldimethoxysilane, G n-HEPUCHIRU diethoxysilane, di-n-octyl dimethoxysilane, Di-n-octyl diethoxysilane, G n-cyclohexyldimethoxysilane, MECHIRU bird acetyloxy SHIRAN besides dialkoxy SHIRAN, such as G n-cyclohexyl diethoxysilane, diphenyldimethoxysilane, and diphenyl diethoxysilane, JIMECHIRU diacetyloxy SHIRAN, etc. can be mentioned.

[0011] Among these, trialkoxysilane and dialkoxy SHIRAN are desirable and as trialkoxysilane Methyl trimethoxysilane and MECHIRU triethoxysilane are desirable and dimethyldimethoxysilane and JIMECHIRU diethoxysilane are still more desirable as dialkoxy SHIRAN.

[0012] In this invention, trialkoxysilane or trialkoxysilane 40 - 95mol % and dialkoxy SHIRAN 60 - 5mol combination with % are desirable especially as ORGANO Silang (1). By using dialkoxy SHIRAN together with trialkoxysilane, the coat obtained can be softened and alkali resistance can be raised.

[0013] ORGANO Silang (1) is used as remaining as it is or a hydrolysis thing, and/or a condensation thing. [when using ORGANO Silang (1) as a hydrolysis thing and/or a condensation thing, can make it able to hydrolyze and condense beforehand, and can also use it as a (a) ingredient, but] When mixing ORGANO Silang (1) with the remaining ingredients and preparing a constituent so that it may mention later, it is desirable by adding a proper quantity of water [(b1) ingredient] etc. to make ORGANO Silang (1) hydrolyze and condense, and to consider it as the (a) ingredient. (a) the time of an ingredient being used as a condensation thing -- the polystyrene equivalent weight average molecular weight (it is called the following "Mw") of this condensation thing -- desirable -- 800-100,000 -- it is 1,000-50,000 still more preferably.

[0014] To the commercial item of the (a) ingredient, moreover, Mitsubishi Chemical MKC silicate, Ethyl silicate by a col coat company, the silicon resin by Toray Industries Dow Corning, The Toshiba Silicone silicon resin, the silicon resin by Shin-Etsu Chemical Co., Ltd., Dow Corning Asia, Inc. -- there are hydronalium KISHIRU machine content Pori dimethylsiloxane of make, Nippon Unicar silicon oligomer, etc. -- these -- as it is -- or you may use it, making it condense.

[0015] In this invention, the (a) ingredient is independent, or two or more sorts can be mixed and used for it.

[0016] Ingredient; (b1) (b1) An ingredient consists of water and/or an organic solvent. The constituent (I) of this invention makes indispensable the above-mentioned (a) ingredient, an ingredient (b1), an after-mentioned (c) ingredient, and the (d) ingredient, and [with a case] (e) - (g) ingredient mentioned later is contained, and when preparing a constituent, it is usually added in order to distribute the particle-like ingredient for which water carries out the hydrolysis and the condensation reaction of ORGANO Silang (1), or mentions it later. 0.5-3mol of the amount of the water used in this invention is usually about 0.7-2mol preferably to the ORGANO Silang (1) 1 mol in the (a) ingredient.

[0017] The above-mentioned organic solvent mainly Moreover, the (a) ingredient, an after-mentioned (c) ingredient, the (d) ingredient, (e) It is used in order to enable it to apply to the various paint methods and to raise the dispersion stability and preservation stability of a constituent further, at the same time it mixes - (g) ingredient etc. uniformly and adjusts the total solid content concentration of a constituent.

[0018] As such an organic solvent, especially if each above-mentioned ingredient is uniformly mixable, it will not be limited, but alcohols, aromatic hydrocarbon, ether, ketone, and ester can be mentioned, for example. As an example of alcohols among these organic solvents Methanol, ethanol, n-propyl alcohol, i-propyl alcohol, n-butyl alcohol, sec-butyl alcohol, t-butyl alcohol, n-hexyl alcohol, n-octyl alcohol, ethylene glycol, Diethylene glycol, triethylene glycol, ethylene glycol monobutyl ether, Ethylene glycol monoethyl ether acetate, diethylene glycol monoethyl ether, propylene glycol monomethyl ether, propylene monomethyl ether acetate, diacetone alcohol, etc. can be mentioned.

[0019] Moreover, as an example of aromatic hydrocarbon, benzene, toluene, xylene, etc. as an example of ether A tetrahydro franc, JIOKISAN, etc. as an example of ketone Acetone, methyl ethyl ketone, methyl isobutyl ketone, diisobutyl ketone, etc. can be mentioned for ethyl acetate, an acetic acid pro pill, butyl acetate, carbonic acid propylene, etc. as an example of ester.

These organic solvents are independent, or can mix and use two or more sorts.

[0020] As for a constituent (I), it is desirable by adding a proper quantity of water [(b1) ingredient] to above-mentioned ORGANO Silang (1) to make ORGANO Silang (1) hydrolyze and condense. In addition, as mentioned above, the hydrolysis thing and/or condensation thing of ORGANO Silang (1) can also be used as a (a) ingredient.

[0021] (c) ingredient; -- the (c) ingredients in this invention are silica and/or alumina, and they are the silica particulates and/or alumina particulates which were preferably distributed to water or the organic solvent -- the form -- silica -- sol and alumina -- sol etc. is contained. 500 micrometers or less of mean particle sizes of these particulates are 200 micrometers or less still more preferably preferably.

[0022] As such a (c) ingredient, as silica For example, Snow textile, iso propanol Silikagel, methanol gel (made by Nissan Chemical Industries, Ltd.); Katha Lloyd, Oscar (made in Catalyst Chemical Industry); Ludox (made by U.S. E. I. du Pont de Nemours & Co.); Nalcoag (made in U.S. Nalco Chemical), etc. can be mentioned. Moreover, as alumina, alumina ****- 100 by Nissan Chemical Industries, Ltd., alumina ****- 200, alumina ****- 520, the aluminum oxide C by West German Degussa AG, etc. are mentioned, for example. In the constituent of this invention, the (c) ingredient is independent, or two or more sorts can be mixed and used for it. (c) the amount used in the constituent (I) of an ingredient receives a (a) ingredient 100 weight part -- usually -- a 5 - 500 weight part -- desirable -- a 10 - 400 weight part -- it is a 20 - 300 weight part still more preferably. A base material or adhesion nature with finishing coat may not be securable in under 5 weight parts. On the other hand, if 500 weight parts are exceeded, the membrane formation nature of the coating material obtained may be inferior, and a crack and exfoliation may be produced.

[0023] (d) Ingredient; the (d) ingredient in the constituent of this invention consists of particulates of a semiconductor which have ultraviolet absorption ability. as the semiconductor which has ultraviolet absorption ability -- TiO_2 of for example, a rutile crystal, ZnO , and CeO_2 etc. -- it can mention -- desirable -- ZnO and CeO_2 it is . In the constituent of this invention, without spoiling coat performance substantially, by the ultraviolet absorption ability of the (d) ingredient, the ultraviolet absorption nature of a coat can be obtained and degradation of the ground by ultraviolet rays and a substrate can be prevented. (d) the granular material which becomes an ingredient's existence form from particulates, the basin system sol which particulates distributed underwater, and the solvent system which particulates distributed in non-polarity solvents, such as polar solvents, such as isopropyl alcohol, and toluene, -- there are three kinds of sol. a solvent system -- in the case of sol, depending on the dispersibility of the above-mentioned semiconductor particulates, you may dilute and use with water or a solvent further. the mean particle size of the semiconductor particulates in these existence forms is so desirable that it is small in the viewpoint of ultraviolet absorption ability -- usually -- 1 micrometer or less of 0.5 micrometer or less is 0.1 micrometer or less especially preferably. (d) It can be considered as the ultraviolet ray absorbent which it has ultraviolet absorption ability equivalent to an organic system ultraviolet ray absorbent, and there is no degradation, and can be semipermanently used by microatomizing an ingredient. Moreover, since uniform dispersibility is good, the coating material excellent in transparency, preservation stability, etc. can be obtained. Such particulates and sol are the purposes, such as improvement in dispersibility and preservation stability, and photocatalyst activity prevention, a surface-active agent, a dispersing agent, a coupling agent, etc. are added, or what performed the surface treatment by this is used preferably. (d) an ingredient -- basin system sol or a solvent system -- 60 or less weight % is desirable still more desirable, and the solid content

concentration in the case of being sol is 50 or less weight %.

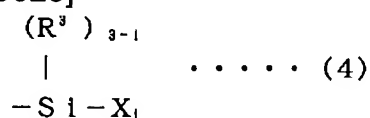
[0024] (d) As a method of blending an ingredient into the constituent of this invention, you may add after manufacture of other ingredients, or it can add at the time of manufacture of the constituent of this invention, and ORGANO Silang which constitutes the (a) ingredient from under existence of the (d) ingredient can be hydrolyzed and partial condensed. (d) If an ingredient is added at the time of manufacture of a constituent, the semiconductor compound in the (d) ingredient can be made to be able to ***** with the (a) ingredient etc., and the dispersibility of the (d) ingredient can be raised. Moreover, it is more desirable to add the (d) ingredient at the time of manufacture of a constituent, also when the viscosity in a system goes up by combination of the (g) ingredient which adding at the time of manufacture of a constituent is desirable, and it mentions later when the (d) ingredient is basin system sol.

[0025] In the commercial item of an ingredient, (d) TIPAQUE TTO by Ishihara Sangyo Kaisha, Ltd., Sumitomo Osaka Cement 143 [ZW-], ZW-513C, ZS-300, ZS-303, ZnO-100, ZnO-200, Z-NOUVE by Mitsui Mining and Smelting Co., Ltd., need RARU by Taki Chemical Co., Ltd., CERIGUARD made from NIPPON MUKI Chemical industry, the Hy Serra super K 29, etc. are mentioned. In the constituent of this invention, the (d) ingredient is independent, or two or more sorts can be mixed and used for it. the amount of the (d) ingredient used in a constituent (I) is solid content to a (a) ingredient 100 weight part (the ORGANO Silang conversion) -- usually -- a 1 - 150 weight part -- it is a 5 - 100 weight part preferably. If it is under 1 weight part, ultraviolet absorption ability may be insufficient, on the other hand, if 150 weight parts are exceeded, the membrane formation nature of the coating material obtained may be inferior, and a crack and exfoliation may be produced.

[0026] Constituent (II) constituent (II) It is the constituent which blended the ingredient (b2) with the above-mentioned (a) ingredient, the (c) ingredient, and the (d) ingredient.

[0027] (b2) ingredient; (b2) -- Kay who combined the ingredient with the hydrolysis nature machine and/or the hydroxyl group -- base -- it consists of a polymer which has preferably the silyl machine (it is called the following "specific silyl machine") which has an atom to the end of a polymer molecule chain, and/or a side chain. Constituent (II) It sets, and when an ingredient (b2) stiffens a coat, and the hydrolysis nature machine and/or hydroxyl group in the silyl machine ***** with the above-mentioned (a) ingredient, it is an ingredient which brings about the outstanding coat performance. (b2) the content of the specific silyl machine in an ingredient -- Kay -- base -- it converts into an atomic quantity and is usually 0.01 to 15 weight % preferably 0.001 to 20weight % to the polymer before introduction of a specific silyl machine. A desirable specific silyl machine is a basis expressed with the following general formula (2).

[0028]

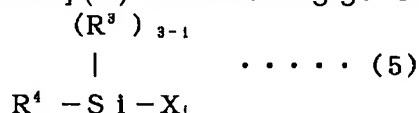


(X show a hydrolysis nature machine or hydroxyl groups, such as a halogen atom, an alkoxy group, an acetoxymachine, a phenoxy group, a CHIOARUKOKISHIRU machine, and an amino group, among a formula, R3 shows the alkyl group of a hydrogen atom and carbon numbers 1-10, or the ARARUKIRU machine of carbon numbers 1-10, and i is the integer of 1-3.)

[0029] (b2) An ingredient can be manufactured by the method of the following (b) or (b), for example.

(**) The method to which this carbon-carbon double bond in the vinyl system polymer (it is called the following "unsaturated vinyl system polymer") which has a carbon-carbon double bond is made to carry out the addition reaction of the hydrosilane compound (for it to be called the following "hydrosilane compound (**)") corresponding to the above-mentioned general formula (2).

[0030] (**) The following general formula (3)



X, R3, and i are synonymous with each X in a general formula (4), R3, and i among [type, and R4 shows the organic group which has a polymerization nature double bond. How to carry out the copolymerization of the Silang compound (for it to be called the following "unsaturated Silang compound (**)") expressed with], and other vinyl system monomers.

[0031] As hydrosilane compound (b) used for the method of being the above-mentioned (b) For example, halogenation Silang, such as MECHIRU dichloro SHIRAN, trichlorosilan, and phenyl dichloro SHIRAN; Methyl dimethoxysilane, Methyl diethoxysilane, phenyl dimethoxysilane, trimethoxysilane, Alkoxysilane, such as triethoxysilane; MECHIRUJI acetoxysilane, Acyloxy SHIRAN, such as phenyl diacetoxysilane and triacetoxysilane; amino KISHISHIRAN, such as MECHIRUJIAMINOKISHISHIRAN, triamino KISHISHIRAN, and dimethylamino KISHISHIRAN, can be mentioned. These hydrosilane compound (b)s are independent, or can mix and use two or more sorts.

[0032] Moreover, especially if the unsaturated vinyl system polymer used for the method of the above-mentioned (**) is except the polymer which has a hydroxyl group, it will not be limited, for example, it can be manufactured with following (**- 1) methods or such combination etc. (**- 2).

(**-1) After polymerizing the vinyl system monomer which has a functional group (it is called the following "functional group (alpha)") (**), How to manufacture the unsaturated vinyl system polymer which has a carbon-carbon double bond to the side chain of a polymer molecule chain by making the unsaturated compound which has this functional group (alpha), the functional

group (it is called the following "functional group (beta)") which can react, and carbon and a carbon double bond react to the functional group (alpha) in a ** (**) polymer.

[0033] (**-2) Use the radical polymerization initiators (for example, 4 and 4-azobis 4-cyano ***** etc.) which have a functional group (alpha). Or the compounds (for example, 4 and 4-azobis 4-cyano ***** , dithio glycolic acid, etc.) which have a functional group (alpha) are used for the both sides of a radical polymerization initiator and a chain transfer agent. After compounding the polymer which has the functional group (alpha) which polymerizes a vinyl system monomer (**) and originates in ***** or both ends of a polymer molecule chain at a radical polymerization initiator or a chain transfer agent (**), How to manufacture the unsaturated vinyl system polymer which has a carbon-carbon double bond in ***** or both ends of a polymer molecule chain by making the unsaturated compound which has a functional group (beta), and carbon and a carbon double bond react to the functional group (alpha) in a ** (**) polymer.

[0034] (**- 1) [and (**- 2)] as an example of the reaction of the functional group (alpha) and functional group (beta) in a method The esterification reaction of a carboxyl group and a hydroxyl group, the **** esterification reaction of a carboxylic anhydride machine and a hydroxyl group, The **** esterification reaction of a carboxyl group and an epoxy group, the amidating reaction of a carboxyl group and an amino group, The **** amidating reaction of a carboxylic anhydride machine and an amino group, the ring-opening addition reaction of an epoxy group and an amino group, the urethane-ized reaction of a hydroxyl group and an isocyanate group, the combination of these reactions, etc. can be mentioned.

[0035] As a vinyl system monomer which has a functional group (alpha) For example, acrylic acid (meta), crotonic acid, maleic acid, fumaric acid, Unsaturated carboxylic acid, such as itaconic acid; Unsaturated carboxylic anhydride;2-hydroxyethyl (meta) acrylate, such as a maleic anhydride and itaconic acid anhydride, 2-hydroxypropyl (meta) acrylate, 3-hydroxypropyl (meta) acrylate, Hydroxyl group content vinyl system monomer;2-aminoethyl (meta) acrylate, such as N-methylol(metha)acrylamide and 2-hydroxyethyl vinyl ether, 2-aminopropyl (meta) acrylate, 3-aminopropyl (meta) acrylate, Amino group content vinyl system monomer;1, such as 2-aminoethyl vinyl ether, 1, and 1-trimethylamine (meta) acrylics IMIDO, 1-*****- 1-ethyl amine (meta) acrylics IMIDO, 1, and 1-*****- 1-(2-hydroxypropyl) amine (meta) acrylics IMIDO, 1, and 1-*****- 1-(2'-phenyl 2'-hydroxyethyl) amine (meta) acrylics IMIDO, Amine IMIDO machine content vinyl system monomers, such as 1 and 1-*****- 1-(2'-hydroxy 2'-FENOKI Cipro pill) amine (meta) acrylics IMIDO; Glycidyl (meta) acrylate, Epoxy group content vinyl system monomers, such as allyl glycidyl ether, etc. can be mentioned. The vinyl system monomer which has these functional groups (alpha) is independent, or can mix and use two or more sorts.

[0036] As the vinyl system monomer which has a functional group (alpha), and other

copolymerizable vinyl system monomers For example, (b) styrene, alpha-methylstyrene, 4-MECHIRU styrene, 2-MECHIRU styrene, 3-MECHIRU styrene, 4-METOKISHI styrene, 2-hydroxymethyl styrene, 4-ethyl styrene, 4-ethoxy styrene, Aromatic series vinyl monomers, such as 3, 4-JIMECHIRU styrene, 3, 4-JIECHIRU styrene, 2-chloro styrene, 3-chloro styrene, 4-chloro 3-MECHIRU styrene, 4-t-butyl styrene, 2, 4-dichloro styrene, 2, 6-dichloro styrene, and 1-vinyl NAFUTAREN;

[0037] (**) MECHIRU (meta) acrylate Ethyl (meta) acrylate, Pro pill (meta) acrylate, n-butyl (meta) acrylate, i-butyl (meta) acrylate, Amir (meta) acrylate, i-Amir (meta) acrylate, It passes and they are acrylate (meta) compounds, such as KISHIRU (meta) acrylate, n-OKUCHIRU (meta) acrylate, and cyclohexyl methacrylate, to KISHIRU (meta) acrylate and 2-ethyl.;

[0038] (Ha) JIBINIRU benzene, ethylene glycol di(metha)acrylate, Diethylene GURIKORUJI (meta) acrylate, triethylene glycol di(metha)acrylate, Tetraethylene glycol di(metha)acrylate, propyleneglycol di(meth) acrylate, Dipropylene GURIKORUJI (meta) acrylate, bird propyleneglycol di(meth) acrylate, Polyfunctional monomers, such as tetra-propyleneglycol di(meth) acrylate, butanediol di(metha)acrylate, hexanediol di(metha)acrylate, TORIMECHI roll propane bird (meta) acrylate, and PENTA erythritol tetra-(meta) acrylate;

[0039] (**) Acryl amide, N-methylol(metha)acrylamide, (Meta) Acid amide compounds, such as N-methoxymethyl (meta) acryl amide, N-butoxy MECHIRU (meta) acryl amide, N, and N'-methylene screw acryl amide, diacetone acrylamide, maleic acid amide, and maleimide;

(e) Vinyl compounds, such as VCM/PVC, a vinylidene chloride, and fatty acid vinyl ester;

(**) 1, 3-butadiene, 2-*****- 1, 3-butadiene, 2, 3-*****- 1, 3-butadiene, 2-neopentyl 1, 3-butadiene, 2-chloro 1, 3-butadiene, Fatty series conjugate JIEN, such as conjugate HEKISAJIEN of substitution straight chain conjugate pen TAJIEN replaced by substituents, such as the 2-cyano 1, 3-butadiene, isoprene, an alkyl group, a halogen atom, and a cyano group, the shape of a straight chain, and the shape of a side chain;

[0040] (g) Cyanidation vinyl compounds, such as acrylonitrile and meta-acrylonitrile;

(**) Fluoride atom content monomers, such as trifluoroethyl (meta) acrylate and pen TADEKAFURU O'Rourke Chill (meta) acrylate;

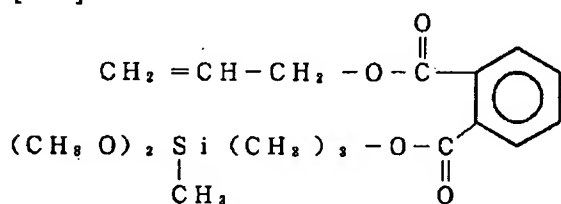
(Li) 4-(meth)acryloyloxy 2, 2, and 6, 6-tetramethylpiperidine, PIPERIJIN system monomers, such as 4-(meta) acryloylamino 2, 2, and 6, 6-tetramethylpiperidine, 4-(meth)acryloyloxy 1, 2, 2, and 6, and 6-pentamethylpiperidine; in addition to this, JIKAPURO lactone etc. is mentioned. Independent one sort or two sorts or more can be used together and used for these.

[0041] As an unsaturated compound which has a functional group (beta), and carbon and a carbon double bond For example, the isocyanate group content unsaturated compound obtained by making it react by Mol [compound / the vinyl system monomer which has a functional group (alpha), the same vinyl system monomer and the above-mentioned hydroxyl

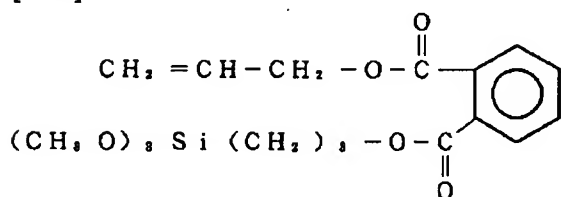
group content vinyl system monomer, / diisocyanate] can be mentioned.

[0042] moreover, as an example of unsaturated Silang compound (b) used for the method of the above-mentioned (b) $\text{CH}_2=\text{CHSi}(\text{CH}_3)(\text{OCH}_3)_2$ and $\text{CH}_2=\text{CHSi}(\text{OCH}_3)_3$, $\text{CH}_3=\text{CHSi}(\text{CH}_3)\text{Cl}_2$ and $\text{CH}_2=\text{CHSiCl}_3$, $\text{CH}_2=\text{CHCOO}(\text{CH}_2)_2\text{Si}(\text{CH}_3)_2$, $(\text{OCH}_3)\text{CH}_2=\text{CHCOO}(\text{CH}_2)_2\text{Si}(\text{OCH}_3)_3$, $\text{CH}_2=\text{CHCOO}(\text{CH}_2)_3\text{Si}(\text{CH}_3)_2$, $(\text{OCH}_3)\text{CH}_2=\text{CHCOO}(\text{CH}_2)_3\text{Si}(\text{OCH}_3)_3$, $\text{CH}_2=\text{CHCOO}(\text{CH}_2)_2\text{Si}(\text{CH}_3)\text{Cl}_2$, $\text{CH}_2=\text{CHCOO}(\text{CH}_2)_2\text{SiCl}_3$ and $\text{CH}_2=\text{CHCOO}(\text{CH}_2)_3\text{Si}(\text{CH}_3)\text{Cl}_2$, $\text{CH}_2=\text{CHCOO}(\text{CH}_2)_3\text{SiCl}_3$ and $\text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{CH}_2)_2\text{Si}(\text{CH}_3)_2$ and $\text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{CH}_2)_2\text{Si}(\text{OCH}_3)_3$ (OCH_3), $\text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{CH}_2)_3\text{Si}(\text{CH}_3)_2$, $(\text{OCH}_3)\text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{CH}_2)_3\text{Si}(\text{OCH}_3)_3$, $\text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{CH}_2)_2\text{Si}(\text{CH}_3)\text{Cl}_2$, $\text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{CH}_2)_2\text{SiCl}_3$, $\text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{CH}_2)_3\text{Si}(\text{CH}_3)\text{Cl}_2$, and $\text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{CH}_2)_3\text{SiCl}_3$, [0043]

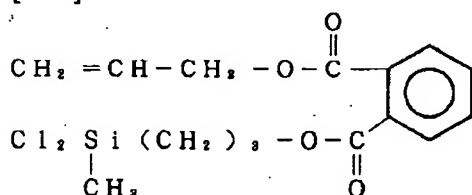
[** 1]



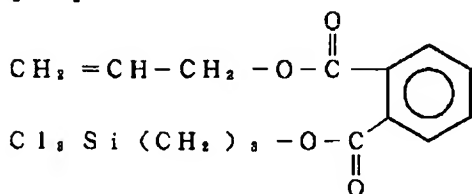
[** 2]



[** 3]



[** 4]



[0044] ***** -- things are made. Independent one sort or two sorts or more can be used together and used for these. Moreover, one or more sorts, such as a vinyl system monomer which has the functional group (alpha) illustrated about the method of the above (**- 1), for

example as other vinyl system monomers which carry out copolymerization to unsaturated Silang compound (**), and other vinyl system monomers, can be mentioned.

[0045] Moreover, as other examples of an ingredient (b2), a specific silyl machine content epoxy resin, specific silyl machine content polyester resin, a specific silyl machine content fluoro-resin, etc. can be mentioned. The above-mentioned specific silyl machine content epoxy resin, for example A bisphenol A type epoxy resin, A screw phenol F type epoxy resin, a **** bisphenol A type epoxy resin, It can manufacture by making amino SHIRAN, the vinylsilane, KARUBOKISHISHIRAN, and glycidyl SHIRAN etc. which have a specific silyl machine react to the epoxy group in epoxy resins, such as fatty series Pori glycidyl ether and fatty series Pori glycidyl ester. Moreover, the above-mentioned specific silyl machine content polyester resin can be manufactured by, for example, making amino SHIRAN, KARUBOKISHISHIRAN, and glycidyl SHIRAN etc. which have a specific silyl machine react to the carboxyl group contained in polyester resin, or a hydroxyl group. Furthermore, the above-mentioned specific silyl machine content fluoro-resin can be manufactured by, for example, making amino SHIRAN, KARUBOKISHISHIRAN, and glycidyl SHIRAN etc. which have a specific silyl machine react to the carboxyl group contained in polymers (**), such as fluoridation ethylene, or a hydroxyl group.

[0046] (b2) the polystyrene conversion number average molecular weight (it is called the following "Mn") of an ingredient -- desirable -- 2,000-100,000 -- it is 4,000-50,000 still more preferably. constituent (II) the amount of the ingredient used which can be set (b2) receives an ORGANO Silang (1) 100 weight part -- usually -- a 2 - 900 weight part -- desirable -- a 10 - 400 weight part -- it is a 20 - 300 weight part still more preferably. In this case, when the amount of the ingredient (b2) used may become what is inferior to alkali resistance in the coat obtained under in 2 weight parts and 900 weight parts are exceeded on the other hand, there is a tendency for the long-term weatherability of a coat to fall.

[0047] As a polymerization method at the time of manufacturing the above-mentioned (b2) ingredient, it bundles up, and after polymerizing in a part of method of adding a monomer and polymerizing, and monomer, the method of adding the remainder continuously or intermittently or the method of adding a monomer continuously from the start of a polymerization is mentioned, for example. Moreover, the polymerization method which combined these polymerization methods is also employable. Solution polymerization is mentioned as a desirable polymerization method. Although the usual thing can be used for the solvent used for solution polymerization, ketone and its alcohols are desirable. A well-known thing can be used for a polymerization initiator, a molecular weight adjustment agent, a chelation agent, and an inorganic electrolyte in this polymerization.

[0048] In this invention, an ingredient (b2) is independent, or two or more sorts obtained as mentioned above can be mixed and used for it. Constituent (II) It is desirable to set and to

make the above-mentioned (b2) ingredient ***** with the (a) ingredient under existence of water and/or an organic solvent.

[0049] In addition, constituent (II) It sets, and since it is the same as that of a constituent (I) about the kind of the (a) ingredient, the (c) ingredient, and (d) ingredient, it omits. (c) the amount used in the constituent (II) of an ingredient receives a total of 100 weight parts of the (a) ingredient and an ingredient (b2) -- solid content -- usually -- a 5 - 500 weight part -- desirable -- a 10 - 400 weight part -- it is a 20 - 300 weight part still more preferably. A base material or adhesion nature with finishing coat may not be securable in under 5 weight parts. On the other hand, if 500 weight parts are exceeded, the membrane formation nature of the coating material obtained may be inferior, and a crack and exfoliation may be produced. moreover -- the amount used in the constituent (II) of the (d) ingredient is solid content to a total of 100 weight parts of the (a) ingredient and an ingredient (b2) -- usually -- a 1 - 150 weight part -- it is a 5 - 100 weight part preferably. If it is under 1 weight part, ultraviolet absorption ability may be insufficient, on the other hand, if 150 weight parts are exceeded, the membrane formation nature of the coating material obtained may be inferior, and a crack and exfoliation may be produced.

[0050] The further following (e) - (g) ingredient can be blended with the constituent (I) and constituent (II) of this invention, respectively. These ingredients are explained hereafter.

[0051] (e) An ingredient (e) ingredient is a catalyst which promotes hydrolysis and condensation reactions, such as the (a) ingredient and an ingredient (b2). (e) while raising the cure rate of the coat obtained by using an ingredient The molecular weight of the Pori Shiroki San resin generated by the heavy condensation reaction of the ORGANO Silang ingredient used becomes large, and intensity and the coat which was excellent in endurance etc. over a long period of time can be obtained, and it becomes easy [thick-film-izing of a coat or paint work].

[0052] As such a (e) ingredient, an acid compound, an alkaline compound, metal salt, an amine compound, an organic metallic compound, and/or its partial hydrolysis thing (an organic metallic compound and/or its partial hydrolysis thing are hereafter called "organic metallic compound" etc. collectively) are desirable. As the above-mentioned acid compound, acetic acid, chloride, sulfuric acid, phosphorus acid, ARUKIRU titanic acid, p-toluenesulfonic acid, phthalic acid, etc. can be mentioned, and it is acetic acid preferably, for example. Moreover, as the above-mentioned alkaline compound, sodium hydroxide, water oxidization potassium, etc. can be mentioned and it is sodium hydroxide preferably, for example. Moreover, as the above-mentioned metal salt, alkaline metal salt, such as naphthenic acid, octylic acid, nitrous acid, sulfurous acid, Al Min acid, and a carbonic acid, etc. can be mentioned, for example.

[0053] As the above-mentioned amine compound, for example Moreover, ethylene diamine, HEKISAMECHI range amine, Diethylene triamine, bird ethylene TETORAMIN, tetra-ethylene

pentamine, PIPERIJIN, PIPERAJIN, m-Feni range amine, p-Feni range amine, Ethanol amine, triethyl amine, 3-aminopropyl trimethoxysilane, 3-aminopropyl triethoxysilane, 3-(2-aminoethyl)-Aminopropyl trimethoxysilane, 3-(2-aminoethyl)-Aminopropyl triethoxysilane, 3-(2-aminoethyl)-Aminopropyl methyl dimethoxysilane, 3-ANIRINO propyltrimethoxysilane and alkylamine salts, Can mention the various denaturation amine used as a hardening agent of an epoxy resin besides quarternary ammonium salt, and preferably 3-aminopropyl trimethoxysilane, 3-aminopropyl triethoxysilane, 3-(2-aminoethyl)-It is aminopropyl trimethoxysilane.

[0054] Moreover, the compound expressed with the following general formula (4) as the above-mentioned organic metallic compound etc., for example (it is called the following "organic metallic compound (4)"), The organic metallic compound (it is called the following "organotin compound") of the tetravalent tin which has 1-2 alkyl groups of the carbon numbers 1-10 combined with the same tin atom, or the partial hydrolysis thing of these compounds can be mentioned.

[0055]

$M(OR_5)_r s (R_6 COCHCOR_7) \dots (4)$

M is shown among [type and JIRUKONIUMU, titanium, or aluminum [R₅ and R₆] It is the same or different and An ethyl group, n-propyl group, i-propyl group, the univalent hydrocarbon group of the carbon numbers 1-6, such as n-butyl group, a sec-butyl group, t-butyl group, n-Penn Chill machine, n-hexyl group, a cyclohexyl machine, and a phenyl group, is shown -- R₇ R₅ And R₆ Others [hydrocarbon group / of the same carbon numbers 1-6 / univalent], A methoxy group, an ethoxy basis, n-propoxy group, i-propoxy group, an n-butoxy machine, The alkoxyl group of the carbon numbers 1-16 of a sec-butoxy machine, a t-butoxy machine, a lauryl OKISHI machine, a stearyl OKISHI machine, etc. is shown, and r and s are the integers of 0-4, and are (r+s)= (valence of M).]

[0056] As an example of an organic metallic compound (4), (b) tetra n-butoxyzirconium, Tree n-butoxy ethyl aceto acetate JIRUKONIUMU, G n-butoxy bis(ethyl aceto acetate)

JIRUKONIUMU, Organic zirconium compounds, such as n-butoxy tris (ethyl aceto acetate)

JIRUKONIUMU, tetrakis (n-pro pill aceto acetate) JIRUKONIUMU, tetrakis (ASECHIRU aceto acetate) JIRUKONIUMU, and tetrakis (ethyl aceto acetate) JIRUKONIUMU;

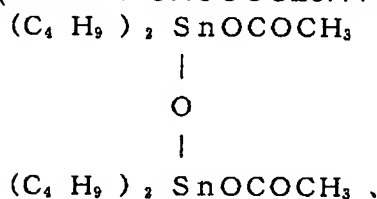
[0057] (**) Organic titanium compounds, such as tetra i-propoxy titanium, G i-propoxy bis(ethyl aceto acetate) titanium, G i-propoxy bis(ASECHIRU acetate) titanium, and G i-propoxy bis (ASECHIRU acetone) titanium;

(Ha) Tree i-propoxy aluminum, G i-propoxy ethyl aceto acetate aluminum, G i-propoxy acetylacetonato aluminum, i-propoxy bis(ethyl aceto acetate) aluminum, i-propoxy bis (acetylacetonato) aluminum, tris (ethyl aceto acetate) aluminum, Organic aluminium compound [, such as tris (acetylacetonato) aluminum and monoacetyl acetate bis(ethyl aceto acetate)

aluminum,]; etc. can be mentioned.

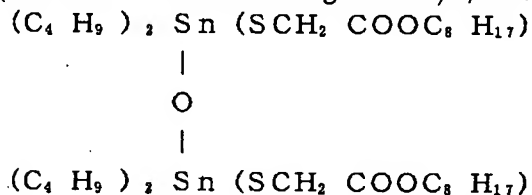
[0058] Tree n-butoxy ethyl aceto acetate JIRUKONIUMU among these organic metallic compounds (4) and the partial hydrolysis thing of those, G i-propoxy bis(acetylacetonato) titanium, G i-propoxy ethyl aceto acetate aluminum, tris (ethyl aceto acetate) aluminum, or the partial hydrolysis thing of these compounds is desirable.

[0059] As an example of an organotin compound, moreover, 2 (C₄ H₉) Sn(OCOC₁₁H₂₃)₂, 2 Sn(OCOCH=CHCOOCH₃)₂, (C₄ H₉)₂ Sn(OCOCH=CHCOOC four H₉)₂, (C₄ H₉)₂ Sn(OCOC₈ H₁₇)₂ and 2 (C₈ H₁₇) Sn(OCOC₁₁H₂₃)₂, (C₈ H₁₇)₂ Sn(OCOCH=CHCOOCH₃)₂, (C₈ H₁₇)₂ Sn(OCOCH=CHCOOC four H₉)₂, (C₈ H₁₇)₂ Sn(OCOCH=CHCOOC eight H₁₇)₂, (C₈ H₁₇)₂ Sn(OCOCH=CHCOOC₁₆H₃₃)₂, (C₈ H₁₇) (C₈ H₁₇)₂ Sn(OCOCH=CHCOOC₁₇H₃₅)₂, 2 (C₈ H₁₇) Sn(OCOCH=CHCOOC₁₈H₃₇)₂, and 2 (C₈ H₁₇) Sn(OCOCH=CHCOOC₂₀H₄₁)₂, [0060]

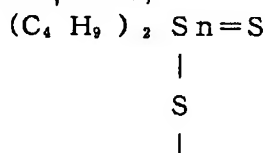


(C₄ H₉) Carboxylic acid type organotin compounds, such as Sn(OCOC₁₁H₂₃)₃ and Sn(C₄ H₉) (OCONa)₃;

[0061] 2 Sn(SCH₂ COOC₈ H₁₇)₂, (C₄ H₉)₂ Sn(SCH₂ CH₂ COOC₈ H₁₇)₂, (C₄ H₉)₂ Sn(SCH₂ COOC₈ H₁₇)₂, (C₈ H₁₇)₂ Sn(SCH₂ CH₂ COOC₈ H₁₇)₂, (C₈ H₁₇)₂ Sn(SCH₂ COOC₁₂H₂₅)₂, (C₈ H₁₇) (C₈ H₁₇)₂ Sn(SCH₂ CH₂ COOC₁₂H₂₅)₂, Sn(C₄ H₉) (SCOCH=CHCOOC eight H₁₇)₃, and Sn(C₈ H₁₇) (SCOCH=CHCOOC eight H₁₇)₃, [0062]

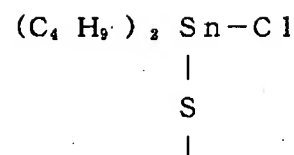


Which MERUKAPUCHIDO type organotin compound;



[0063] (C₄ H₉)₂ Sn=S, 2 (C₈ H₁₇) Sn=S, (C₄ H₉)₂ Sn=S

Which SURUFIDO type organotin compound;



[0064] $(\text{C}_4 \text{H}_9)_2 \text{SnCl}_3$, $2 (\text{C}_4 \text{H}_9)_2 \text{SnCl}_2$, and $2 (\text{C}_8 \text{H}_{17})_2 \text{SnCl}_2$, $(\text{C}_4 \text{H}_9)_2 \text{Sn}-\text{Cl}$

Which chloride type organotin compound; $(\text{C}_4 \text{H}_9)_2 \text{SnO}$, $(\text{C}_8 \text{H}_{17})_2 \text{SnO}$, Reaction product [of organic tin oxide, such as 2SnO , these organic tin oxide, and ester compounds, such as silicate, maleic acid JIMECHIRU, maleic acid JIECHIRU, and dioctyl phthalate,]; etc. can be mentioned.

[0065] (e) An ingredient is independent, or two or more sorts can be mixed and used for it, and they can also be used for it, mixing with the reaction delay agent of a zinc compound or others.

[0066] (e) An ingredient may be blended with a constituent in the stage which may blend when preparing a constituent, and forms a coat, and may be further blended in the stage of both manufacture of a constituent and formation of a coat. (e) As opposed to the whole-quantity 100 weight part of ORGANO Silang (1) [in / cases other than an organic metallic compound etc. / in the amount of the ingredient used / the above-mentioned (a) ingredient], and the specific silyl machine in the above-mentioned (b2) ingredient usually, a 0 - 100 weight part -- desirable -- 0.01 - 80 weight part -- still more preferably 0.1 - 50 -- weight -- a part -- it is -- an organic metallic compound -- etc. -- a case -- the above -- (-- a --) -- an ingredient -- it can set -- ORGANO -- Silang -- (-- one --) -- and -- the above (b2) -- an ingredient -- it can set -- specification -- silyl -- a machine -- the whole quantity -- 100 -- weight -- a part -- receiving -- usually, a 0 - 100 weight part -- desirable -- 0.1 - 80 weight part -- it is 0.5 - 50 weight part still more preferably. In this case, when the amount of the (d) ingredient used exceeds 100 weight parts, the preservation stability of a constituent falls or the tendency a crack becomes easy to generate is in a coat.

[0067] (f) An ingredient (f) ingredient is the following general formula (5).

$\text{R}_6 \text{COCH}_2 \text{COR}_7 \dots (5)$

beta-JIKETON and beta-KETOESUTERU which are expressed with] of each above-mentioned general formula [in / in R_6 and R_7 / an organic metallic compound (4)] respectively synonymous with R_6 and R_7 among [type, It is at least one sort chosen from the group which consists of a carboxylic acid compound, a dihydroxy compound, an amine compound, and an OKISHI aldehyde compound. As for such a (f) ingredient especially, it is desirable to use together, when using an organic metallic compound etc. as the above-mentioned (e) ingredient.

[0068] (f) An ingredient acts as a stability improvement agent of a constituent. Namely, by the (f) ingredient's making at least ** metal atoms, such as the above-mentioned organic metallic

compound, and controlling moderately the operation which promotes ***** of the above-mentioned (a) ingredient and an ingredient (b2) by this organic metallic compound etc. It is presumed that the operation which raises the preservation stability of the constituent obtained further is made.

[0069] As an example of an ingredient, (f) ASECHIRU acetone, methyl acetoacetate, Ethyl acetoacetate, an acetoacetic acid-n-pro pill, an acetoacetic acid-i-pro pill, Acetoacetic acid-n-butyl, acetoacetic acid-sec-butyl, acetoacetic acid-t-butyl, *****- 2, 4-dione, Cheb ****- 2, 4-dione, Cheb ****- 3, 5-dione, *****- 2, 4-dione, *****- 2, 4-dione, 5-methylhexane 2, 4-dione, Malonic acid, oxalic acid, phthalic acid, glycolic acid, salicylic acid, aminoacetic acid, IMINO acetic acid, ethylenediaminetetraacetic acid, a glycol, KATEKORU, ethylene diamine, 2 and 2-BIPIRIJIN, 1, 10-phenanthro phosphorus, diethylene triamine, 2-ethanol amine, JIMECHIRUGURIOKISHIMU, JICHIZON, methionine, salicyl aldehyde, etc. can be mentioned. ASECHIRU acetone and ethyl acetoacetate are [among these] desirable. (f) An ingredient is independent, or two or more sorts can be mixed and used for it.

[0070] (f) 2mol or more of the amount of the ingredient used is usually 3-20mol preferably to 1mol of organic metallic compounds in the above-mentioned organic metallic compound etc. In this case, there is a tendency for the amount of the (f) ingredient used to become insufficient [less than 2mol / the improvement effect of the preservation stability of the constituent obtained].

[0071] (g) An ingredient (g) ingredient consists of the granular materials and/or sol, or colloid of an inorganic compound other than the (c) ingredient and the (d) ingredient, and is blended according to the characteristic of a request of a coat. (g) When an ingredient is sol or colloid, the average particle diameter is usually about 0.005-100 micrometers.

[0072] As an example of the compound to make, an ingredient (g) AlGaAs and aluminum(OH) 3, Sb2 O5, Si3 N4, Sn-In 2O3, and Sb-In 2O3, MgF, CeF3, BeO, SiC, AlN, Fe, Co, and Co-FeOx, CrO2, Fe4 N, BaTiO3, and BaO-aluminum2 O3-SiO2, Ba ferrite, SmCO5, YCO5, CeCO5, and PrCO5, Sm2 CO17, Nd2 Fe14B, aluminum4 O3, alpha-Si, SiN4, CoO, Sb-SnO2, and Sb2 O5 and MnO2, MnB, Co3 O4, Co3 B, LiTaO3, MgO, and MgAl2 O4, BeAl2 O4, ZrSiO4, ZnSb, PbTe, GeSi, FeSi2, CrSi2, CoSi2, MnSi1.73, Mg2 Si, Beta-B, BaC, BP, TiB2, ZrB2, HfB2, and Ru2 Si3, TiO3, PbTiO3, aluminum2 TiO5, Zn2 SiO4, Zr2 SiO4, and 2MgO2-aluminum2 O3-5SiO2 and Nb2 O5, Li2 O-aluminum2 O3-4SiO2, Mg ferrite nickel ferrite, a nickel-Zn ferrite, Li ferrite, Sr ferrite, etc. can be mentioned. These (g) ingredients are independent, or two or more sorts can be mixed and used for them.

[0073] (g) There is the sol or colloid of a solvent system distributed in polar solvents distributed in a granular material and water, such as sol of a basin system or colloid, and isopropyl alcohol, and non-polarity solvents, such as toluene, in an ingredient's existence form. The sol of a solvent system, or in the case of colloid, in order to dilute and use with water or a solvent

further depending on the dispersibility of a semiconductor and to raise dispersibility, a surface treatment may be carried out and you may use.

[0074] (g) When an ingredient is the sol or colloid of the sol of a basin system, colloid, or a solvent system, as for solid content concentration, 40 or less weight % is desirable.

[0075] (g) As a method of blending an ingredient into a constituent, you may add after manufacture of a constituent, or it may add at the time of manufacture of a constituent, and the cohydrolysis and condensation of the (g) ingredient may be done with the above-mentioned (a) ingredient, an ingredient (b2), or the above-mentioned condensation thing.

[0076] (g) ORGANO Silang [in / in the amount of the ingredient used / the above-mentioned (a) ingredient] -- it is solid content to the whole-quantity 100 weight part of (1) and the above-mentioned (b2) ingredient -- usually -- a 0 - 500 weight part -- it is a 0.1 - 400 weight part preferably.

[0077] The constituent used for other additive agents and this inventions can also be made to add and distribute a filler separately for coloring of the coat obtained, thick-film-izing, etc. As such a filler, Ceramics Sub-Division of the shape of a particle other than the organic color and inorganic pigment of non-water solubility, and paints, and the fibrous or the shape of a piece of a scale, metal or an alloy and the oxide of such metal, hydroxide, carbide, a nitriding thing, a sulfide, etc. can be mentioned, for example.

[0078] As an example of the above-mentioned filler, iron, copper, aluminum, nickel, silver, Zinc, a ferrite, carbon black, stainless steel, 2 silicon oxides, Chromic oxide, manganese oxide, iron oxide, synthetic MURAITO, aluminium hydroxide, Iron hydroxide, silicon carbide, silicon nitride, boron nitride, Clay, diatomite, Slaked lime, gypsum, talc, barium carbonate, calcium carbonate, magnesium carbonate, Barium sulfate, a vent night, mica, zinc green, chromium green, the Cobalt green, Kinky thread JIAN, GINE green, cobalt chrome green, Swedish green, terre belt, manganese green, Pigment Green, ultramarine, Prussian blue, pigment Green, mountain blue, the Cobalt blue, Cerulean blue, boric acid copper, molybdenum blue, copper sulfide, the Cobalt purple, The Mars purple, manganese purple, pigment violet, lead suboxide, plumbic acid calcium, Zinc yellow, a lead sulfide, chromium yellow, ocher, cadmium yellow, strontium yellow, Titanium yellow, RISAJI, pigment yellow, cuprous oxide, cadmium red, Selenium red, a chromium vermilion, red ocher, zinc white, antimony white, basic lead sulfate, a white titanium pigment, RITOPON, a lead silicate, oxidization zircon, tungsten white, a lead, a flower of zinc, the Van Ji Sung white, lead phthalate, manganese white, lead sulfate, Black lead, bone black, diamond black, Sir MATOMIKKU black, vegetable black, a potassium titanate whisker, molybdenum disulfide, etc. can be mentioned. These fillers are independent, or two or more sorts can be mixed and used for them. The amount of the filler used is usually below 300 weight parts to all the solid content 100 weight parts of a constituent.

[0079] To the constituent of this invention, by request, furthermore, ORUTOGI acid MECHIRU,

alt. acetic acid MECHIRU, Well-known dehydrators, such as tetra-ethoxy SHIRAN; Polyoxyethylene alkyl ether, Polyoxyethylene alkyl phenyl ether, polyoxy ethylene fatty acid ester, A polycarboxylic acid type polymer surface-active agent, polycarboxylic acid salt, polyphosphoric acid salt, Dispersing agents, such as polyacrylic acid salt, polyamide ester salt, and polyethylene glycols; Methyl cellulose, Ethyl cellulose, hydroxyethyl cellulose, hydroxypropylcellulose, Cellulose, castor oil derivatives, such as hydroxypropyl methylcellulose, Thickeners, such as Ferro **** acid chloride; Ammonium carbonate, carbonated water matter ammonium, Inorganic foaming agents, such as ammonium nitrite, sodium borohydride, and calcium azido, Hydrazine compounds, such as azo compounds, such as azobis isobutyronitrile, diphenylsulfone 3, and 3'-disulfo HIDORAJIN, Other additive agents, such as a surface-active agent besides organic blowing agents, such as a semi KARUBAJIDO compound, a bird AZORU compound, and N-nitroso compound, the Silang coupling agent, a titanium coupling agent, and dye, can also be blended. Moreover, when using especially the constituent of this invention as a coating constituent for the coating under this invention, you may use together an organic system ultraviolet ray absorbent, ultraviolet stabilizer, etc. with the (d) ingredient in order to raise weatherability and durable adhesion nature. As an organic system ultraviolet ray absorbent, a salicylic acid system, a benzoFENON system, a benzobird AZORU system, a cyanoacrylate system, a triazine system, etc. are mentioned. Moreover, a PIPERIJIN system etc. is mentioned as ultraviolet stabilizer.

[0080] Moreover, a leveling agent can be blended in order to raise the coating nature of a constituent more. The leveling agent of a fluoride system among such leveling agents (brand name.) As being the same as that of the following, for example BM1000 of BIEMUHEMI (BM-CHEMIE), and BM1100; -- FUIOREN series [made from Efka 772 of Efka Chemicals, and Efka 777; Kyoeisha Chemistry]; -- FC series [of Sumitomo 3M, Inc.]; -- [the full ONARU TF series of Toho Chemical Co., Ltd. etc.] Can mention and as a leveling agent of a silicone system For example BYK series [of big KEMI]; -- Sshmeggo series [of Sumeg Mann (Sshmegmann)]; -- [Efka 30 of Efka Chemicals, Efka 31, Efka 34, Efka 35, Efka 36, Efka 39, Efka 83, Efka 86, Efka 88, etc.] it can mention -- as the leveling agent of an ether system or an ester system -- car FINORU; of Nissin Chemical Industry Co., Ltd. -- the emulgen of Kao Corp., gay GENORU, etc. can be mentioned.

[0081] By blending such a leveling agent, the result appearance of a coat is improved and it can apply uniformly also as a thin film. The amount of the leveling agent used is 0.02 to 3 weight % still more preferably 0.01 to 5weight % preferably to all the constituents.

[0082] You may blend with a constituent in the stage which may blend as a method of blending a leveling agent when preparing a constituent, and forms a coat, and may blend in the stage of both manufacture of a constituent and formation of a coat further.

[0083] In addition, to the constituent used for this invention, you may blend other resin. When

using as a coating constituent for bottom coating especially, according to a base material, you may blend other resin. As other resin, acrylics urethane resin, an epoxy resin, polyester, an acrylic resin, a fluoro-resin, acrylic resin emulsion, epoxy resin emulsion, polyurethane emulsion, polyester emulsion, etc. are mentioned.

[0084] Moreover, in a constituent (II), water (b1) and/or the organic solvent can be blended separately. In this case, the loadings of an ingredient (b1) are the same as that of a constituent (I).

[0085] When facing preparing the constituent of this invention and not using the (e) ingredient and the (f) ingredient Although the mixed method in particular of each ingredient is not limited, when using the (e) ingredient and the (f) ingredient, after obtaining the mixture except the (f) ingredient among (a) - (g) ingredients, the method of adding the (f) ingredient is preferably adopted as this.

[0086] Preferably, the total solid content concentration of the constituent (I) used for this invention and a constituent (II) is 50 or less weight %, and is suitably adjusted according to the purpose of use. For example, when aiming at sinking in to a thin film formation base material, it is usually 1 to 30 weight %, and when using thick film formation for the purpose, it is usually 20 to 45 weight % preferably ten to 50weight %. When the total solid content concentration of a constituent exceeds 50 weight %, there is a tendency for preservation stability to fall.

Especially the coating constituent for the coating under this invention is suitably adjusted according to the kind of base material, the paint method, paint film thickness, etc., although it is desirable that total solid content concentration is 1 to 30 weight %.

[0087] As a suitable base material to use the coating constituent of this invention For example, metal, such as iron, aluminum, and stainless steel; Cement, concrete, ALC, a flexible board, mortar, a slate, gypsum, Ceramics Sub-Division, Inorganic pottery-industry system material, such as brick; Phenol resin, an epoxy resin, polyester, Plastic-goods-molding articles, such as polycarbonate, polyethylene, polypropylene, and ABS resin (acrylonitrile butadiene styrene resin); Polyethylene, Plastic films, such as polypropylene, polyvinyl alcohol, polycarbonate, polyethylene terephthalate, polyurethane, and polyimide, wood, paper, glass, etc. can be mentioned. Moreover, the constituent of this invention is useful also to re-paint of a degradation coat. A surface treatment can also be beforehand performed to these base materials on preparation of surfaces and an adhesion disposition for the purpose of the eye stop of a porosity base material, smoothing, encaustic attachment, etc. As a surface treatment to a metal system base material, for example Polish, degreasing, plating processing, [can mention chromate treatment, flame processing, coupling processing, etc., and] as a surface treatment to a plastic system base material For example, blast processing, medicine processing, degreasing, flame processing, oxidation treatment, steamy processing, [can mention corona discharge treatment, ultraviolet-rays irradiation processing, plasma

polymerization, ion processing, etc., and] as a surface treatment to an inorganic pottery-industry system base material for example, [can mention polish, an eye stop, encaustic attachment, etc. and] as a surface treatment to a woody base material For example, polish, an eye stop, insect control processing, etc. can be mentioned, as a surface treatment to a quality-of-paper base material, an eye stop, insect control processing, etc. can be mentioned and Keren etc. can be further mentioned as a surface treatment to a degradation coat, for example.

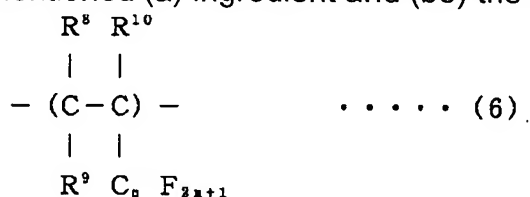
[0088] You may use a primer for the coating constituent of this invention if needed. **. For example, since a primer is used and the concealment nature of a coat changes with characteristics (surface roughness, sinking-in nature, alkalinity, etc.) of a base material in addition to the coating constituent for the coating under this invention in the case of an inorganic pottery-industry system base material if there is the necessity for rust prevention in the case of a metal system base material, a primer may be used. Moreover, in re-paint of a degradation coat, a primer is used when degradation of the old coat is remarkable. In the case of the other base material, for example, a plastic, wood, paper, glass, etc., even if it uses a primer according to a use, it is not necessary to use. The kind in particular of primer is not limited but is chosen according to the kind of base material, and the purpose of use that what is necessary is just what has the operation which raises the adhesion nature of a base material and a constituent. a primer -- independent -- or the enamel which can mix and use two or more sorts, and contains coloring ingredients, such as paints, does not contain this coloring ingredient, either -- being clear .

[0089] As a kind of primer, for example Alkyd resin, amino alkyd resin, An epoxy resin, polyester, an acrylic resin, urethane resin, a fluoro-resin, acrylics silicone resin, acrylic resin emulsion, epoxy resin emulsion, polyurethane emulsion, polyester emulsion, etc. can be mentioned. Moreover, when the adhesion nature of the base material in severe conditions and a coat is required, various kinds of functional groups can also be given to these primers. As such a functional group, a hydroxyl group, a carboxyl group, a carbonyl group, an amide machine, an amine machine, a glycidyl group, an alkoxy silyl machine, an ether bond, an ester bond, etc. can be mentioned, for example. Furthermore, an ultraviolet ray absorbent, ultraviolet stabilizer, etc. may be blended with the primer. As a method of applying to a substrate the constituent used for this invention In [any] a constituent, the brush, a roll coater, a flow coater, centrifugal Caux Tarr, ultrasonic Caux Tarr, photogravure (micro) KOTA, etc. are used, or a dip coat, sink coating, a spray, screen process, electrodeposition, vapor deposition, etc. are mentioned. Moreover, bottom coating can be beforehand given to a substrate and the constituent of this invention can also be applied.

[0090] The constituent used for this invention can form a coat about 0.02-40 micrometers thick by coating once as dryness film thickness by about 0.01-20 micrometers in thickness, and 2

times coating. Then, a coat can be formed by drying in normal temperature, or heating about 1 to 60 minutes and usually drying at the temperature of about 30-200 degrees C.

[0091] The coating constituents for the coating under coating constituent this invention for bottom coating are the above-mentioned constituent (I) and a constituent (II). It uses for bottom coating. Although various paints are mentioned as a paint suitable as finishing coat of the coating constituent for the coating under this invention, a photocatalyst content paint, a silicone system paint, a fluoride system paint, etc. can be mentioned, for example. The constituent which contains the constituent, the above-mentioned (a) ingredient, ingredient (b2), and photocatalyst containing the above-mentioned (a) ingredient, an ingredient (b1), and a photocatalyst as a constituent used as the above-mentioned photocatalyst content paint, for example is mentioned. In these constituents, the above-mentioned (c) ingredient - (g) ingredient may contain. Moreover, as a photocatalyst, titanium oxide particulates, titanium oxide sol, etc. are used suitably. The constituent which contains the constituent, the above-mentioned (a) ingredient, and (b2) ingredient containing the above-mentioned (a) ingredient and (b1) an ingredient as a constituent used as the above-mentioned silicone system paint, for example is mentioned. In these constituents, the above-mentioned (e) ingredient - (g) ingredient may contain. Furthermore, the basin system dispersing element which distributed the polymer obtained by making condense the (a) ingredient and (b2) an ingredient in the basin system medium can also be used as a coating constituent. As a constituent used as the above-mentioned fluoride system paint, it is the constitutional unit expressed with the above-mentioned (a) ingredient and (b3) the following general formula (6), for example.



(-- the integer of $\text{C}_m \text{Y}_{2m+1}$ and $m = 0-5$ and Y are independently chosen for $\text{R}^8 - \text{R}^{10}$ from F , H , and Cl among a formula, respectively.) -- Kay who has and combined with the hydrolysis nature machine and/or the hydroxyl group -- base -- the constituent containing the copolymer containing the silyl machine which has an atom etc. is mentioned. In these constituents, the above-mentioned (e) ingredient - (g) ingredient may contain.

[0092] The base material used suitably for the coating constituent of above-mentioned this invention as a base material used suitably for the coating constituent for the coating under this invention is mentioned. As mentioned above, a surface treatment can also be beforehand performed to these base materials. Moreover, you may use a primer further in addition to the coating constituent for the coating under this invention. Especially, to plastic base materials, such as the above-mentioned plastic-goods-molding article and a plastic film, the coating

constituent for the coating under this invention prevents degradation of a base material, and raises more long-term adhesion nature with finishing coat.

[0093] The coating constituent for the coating under this invention can make a coat about 0.02-40 micrometers thick form by coating once as dryness film thickness by about 0.01-20 micrometers in thickness, and 2 times coating. Then, a coat can be formed in various kinds of base materials by drying in normal temperature, or heating about 1 to 60 minutes and usually drying at the temperature of about 30-200 degrees C. In addition, the total film thickness of a bottom coating layer and finishing coat is dryness film thickness, and is usually about 0.08-60 micrometers preferably 0.04-80 micrometers.

[0094]

[Example] Hereafter, a work example is given and the form of operation of this invention is explained still more concretely. However, this invention is not restrained at all by these work examples. In addition, the part in a work example and a comparative example and % are weight standards unless it mentions specially. Moreover, various kinds of measurement and evaluations in a work example and a comparative example were performed by the following method.

[0095] (1) Hardness JIS It depended on the pencil hardness by K5400.

(2) the account of self-[rate Hitachi of ultraviolet absorption] -- a spectrum -- with the photometer, the transmissivity curve of 360nm or less was measured, and it evaluated by the following valuation basis.

O; the rate of ultraviolet absorption measures the transmissivity of visible light, after the rate of 90% or more O; ultraviolet absorption applies so that 50% or more and the rate of less than 80% x; ultraviolet absorption may become 10 micrometers of dryness film thickness on silica glass about less than 50% transparency [(3)] class product in 80% or more and the rate of less than 90% **; ultraviolet absorption. The following standard estimated.

O; -- transmissivity -- more than 90% O; -- after transmissivity immersed to 80% or more, less than [90%] **; transmissivity immersed to 70% or more and less than [80%] x; transmissivity immersed (4) alkali-resistance specimen for 60 days into saturation calcium hydroxide solution less than 70%, the state of the coat was observed by viewing.

(5) After dropping two cc of isopropyl alcohol on the organicity-proof medicine nature coat and wiping off with cloth 5 minutes afterward, the state of the coat was observed by viewing.

(6) After holding the piece of a humidity test continuously under the environment of the temperature of 50 degrees C, and 95% of humidity for 1,000 hours, it took out and the state of the coat was observed by viewing.

(7) adhesion nature JIS By the squares test (eye **** 100 pieces) by K5400, the tape friction test was carried out 3 times and it depended on the average.

(8) Weatherability JIS By K5400, the irradiation examination was carried out in sunshine

weather meter for 3,000 hours, and the appearance (divided peeling etc.) of the coat was observed by viewing.

(9) The tape friction test was carried out 3 times after the weather resistant test of long-term adhesion nature (8), and the following standard estimated the existence of exfoliation.

O :-exfoliation-less ** : after the exfoliation (10) water-resistance specimen was immersed for 60 days in normal temperature into tap water exfoliation 1-2 time x:3 time, the state of the coat was observed by viewing.

(11) After the specimen using warm water-proof nature minerals material was immersed for 14 days into 60-degree C warm water, the state of the coat was observed by viewing.

[0096] The example 1 of reference [(b2) composition of an ingredient]

It is 70 copies of methyl methacrylate to a reflux condenser and the reaction machine equipped with the churning machine, 40 copies of n-butyl acrylate, 20 copies of gamma-methacryloxypropyl trimethoxy silane, Five copies of acrylic acid, 13 copies of 2-hydroxyethyl methacrylate, 1 and 1, one copy of 1-trimethylamine methacrylic IMIDO, 4-(meth)acryloyloxy 2, 2, and 6, one copy of 6-tetramethylpiperidine, After adding 150 copies of i-propyl alcohol, 50 copies of methyl ethyl ketone, and 25 copies of methanol and mixing, It warmed at 80 degrees C, agitating, and after being dropped at it, having covered the solution which dissolved four copies of azobisiso valeronitrile in ten copies of xylene over this mixture for 30 minutes, it was made to react at 80 degrees C for 5 hours, and the polymer solution (henceforth "" (b2-1)) of 40% of solid content concentration was obtained.

[0097] The example 2 of reference [(b2) composition of an ingredient]

It is 70 copies of methyl methacrylate to a reflux condenser and the reaction machine equipped with the churning machine, 40 copies of n-butyl acrylate, 20 copies of gamma-methacryloxypropyl trimethoxy silane, 18 copies of glycidyl methacrylate, 1 and 1, one copy of 1-trimethylamine methacrylic IMIDO, 4-(meth)acryloyloxy 2, 2, and 6, one copy of 6-tetramethylpiperidine, After adding 150 copies of i-propyl alcohol, 50 copies of methyl ethyl ketone, and 25 copies of methanol and mixing, It warmed at 80 degrees C, agitating, and after being dropped at it, having covered the solution which dissolved four copies of azobisiso valeronitrile in ten copies of xylene over this mixture for 30 minutes, it was made to react at 80 degrees C for 5 hours, and the polymer solution (henceforth "" (b2-2)) of 40% of solid content concentration was obtained.

[0098] The example 3 of reference [(b2) composition of an ingredient]

It is 70 copies of methyl methacrylate to a reflux condenser and the reaction machine equipped with the churning machine, 30 copies of n-butyl acrylate, 20 copies of gamma-methacryloxypropyl trimethoxy silane, 18 copies of hydroxy acrylate, ten copies of acryl amide, 1 and 1, one copy of 1-trimethylamine methacrylic IMIDO, 4-(meth)acryloyloxy 2, 2, and 6, one copy of 6-tetramethylpiperidine, After adding 150 copies of i-propyl alcohol, 50 copies of

methyl ethyl ketone, and 25 copies of methanol and mixing, It warmed at 80 degrees C, agitating, and after being dropped at it, having covered the solution which dissolved four copies of azobisisobutyronitrile in ten copies of xylene over this mixture for 30 minutes, it was made to react at 80 degrees C for 5 hours, and the polymer solution (henceforth "" (b2-3)) of 40% of solid content concentration was obtained.

[0099] The example 4 of reference [(b3) composition of an ingredient]

After nitrogen gas replaces enough the autoclave equipped with the electromagnetism churning machine made from stainless steel, Nitrogen gas after teaching 150 copies, 86 copies of ethyl vinyl ether, and 1.5 copies of lauroyl peroxide (radical polymerization initiator) for methyl isobutyl ketone in this autoclave and cooling the solution in an autoclave to -50 degree C with dry ice methanol Oxygen in a system was removed again. Subsequently, two copies of hexafluoropropylene, two copies of perfluoro (propyl vinyl ether), and ten copies of vinyltrimethoxysilane were added, and **** was started. The pressure in the autoclave at the time of the temperature in an autoclave amounting to 60 degrees C is 5kgf/cm². It was. By agitating holding the temperature of the system of reaction at 60 degrees C, a polymerization reaction is made to continue for 20 hours, and the pressure in an autoclave is 1.5kgf/cm². When it fell, it water-cooled and the reaction was stopped, and the ingredient (b3) (henceforth "" (b3-1)) of 40% of solid content concentration was obtained.

[0100] The example 5 of reference [(b3) composition of an ingredient]

After nitrogen gas replaces enough the autoclave equipped with the electromagnetism churning machine made from stainless steel, Nitrogen gas after teaching 150 copies, 30 copies of ethyl vinyl ether, and 1.5 copies of lauroyl peroxide (radical polymerization initiator) for methyl isobutyl ketone in this autoclave and cooling the solution in an autoclave to -50 degree C with dry ice methanol Oxygen in a system was removed again. Subsequently, 30 copies of hexafluoropropylene, 30 copies of perfluoro (propyl vinyl ether), and ten copies of vinyltrimethoxysilane were added, and **** was started. The pressure in the autoclave at the time of the temperature in an autoclave amounting to 60 degrees C is 5kgf/cm². It was. By agitating holding the temperature of the system of reaction at 60 degrees C, a polymerization reaction is made to continue for 20 hours, and the pressure in an autoclave is 1.5kgf/cm². When it fell, it water-cooled and the reaction was stopped, and the ingredient (b3) (henceforth "" (b3-2)) of 40% of solid content concentration was obtained.

[0101] The synthetic examples 1-6 [composition of a coating constituent]

After adding each ingredient (except water and a post-addition ingredient) of a kind and number of copies indicated to Table 1 to a reflux condenser and the reaction machine equipped with the churning machine and agitating in them, the description to Table 1 carried out number-of-copies dropping, and water was made to react to them at 60 degrees C under churning for 4 hours. Subsequently, the post-addition ingredient was added, it cooled to room

temperature, and the constituent of 30% of solid content concentration was obtained. To 100 copies of obtained constituents, they are 100 copies of i-butyl alcohol, and 100 copies of propylene-glycol-monomethyl-ether acetate. In addition, after mixing well, it added, and it was good, ten copies of i-propyl alcohol solution (15% of solid content) of JIOKUCHIRU tin dimaleate ester was agitated, and coating constituent (I-1) - (I-6) of this invention was obtained.

[0102]

[Table 1]

合成例	1	2	3	4	5	6
組成物名称	I-1	I-2	I-3	I-4	I-5	I-6
配合処方 (部)						
(a) 成分;						
メチルトリメトキシシラン	70	70	35	35	35	20
ジメチルジメトキシシラン	30	30	15	15	15	5
(b 1) 成分;						
水	30			15		
1-ブチルアルコール	100	100	100	100	100	100
エチレングリコールモノブチル	75	75	75	75	75	75
エーテル						
(b 2) 成分;						
(b 2-1) 固形分40%			50			75
(b 2-2) 固形分40%				50		
(b 2-3) 固形分40%					50	
(c) 成分; シリカ ^{*1}	75		50	150	100	
アルミナ ^{*2}		50	25		25	50
(d) 成分; ZnO / IPA ^{*3}	75		75	75	100	75
CeO ₂ / IPA ^{*4}		75		75		
ジ-1-プロポキシ・エチルアセ	10	10	5	5	5	5
トアセテートアルミニウム						
後添加成分; アセチルアセトン	10	10	5	5	5	5

[0103] Constituent (i-1) - for comparison (i-3) was obtained like the synthetic example 1 except having been as the example 1 of comparison composition - 3 combination composition having been shown in Table 2.

[0104]

[Table 2]

比較合成例	1	2	3
組成物名称	1-1	1-2	1-3
配合処方 (部)			
(a) 成分 ;			
メチルトリメトキシシラン	70	35	35
ジメチルジメトキシシラン	30	15	15
(b 1) 成分 ;			
水	30		
1-プロチルアルコール	100	100	100
エチレングリコールモノプロチルエーテル	75	75	75
(b 2) 成分 ; (b 2-1) 固形分 40 %		50	50
(c) 成分 ; シリカ ^{*1}	75		75
アルミナ ^{*2}			
(d) 成分 ; ZnO / IPA ^{*3}		75	
CeO ₂ / IPA ^{*4}			
ジ-1-プロポキシ・エチルアセトアセテ	10	5	5
ートアルミニウム			
後添加成分			
アセチルアセトン	10	5	5

[0105] In Table 1 and 2, *1 - *4 are as follows.

*1: i-propyl alcohol distribution silica -- sol (30% of silica concentration)

*2: water distribution alumina -- sol (20% of alumina concentration)

*3: i-propyl alcohol distribution ZnO (30% of ZnO concentration)

*4: i-propyl alcohol distribution CeO₂ (CeO₂ 30% of concentration)

[0106] The coating constituent obtained in work examples 1-6, the comparative example 1 - the example of 3 composition, and the example of comparison composition was applied and dried by bar KOTA to the silica glass board, the coat of 10 micrometers of film thickness was formed, and evaluation of hardness, the rate of ultraviolet absorption, and transparency was performed using this. Moreover, the above-mentioned coating constituent was applied and dried by bar KOTA on the 50-micrometer-thick PET film, the coat was formed, and others were evaluated using this. A result is shown in Table 3 and 4.

[0107]

[Table 3]

実施例	1	2	3	4	5	6
組成物	I-1	I-2	I-3	I-4	I-5	I-6
硬度	3H	3H	2H	2H	2H	2H
紫外線吸収率	◎	◎	◎	◎	◎	◎
透明性	◎	◎	◎	◎	◎	◎
耐アルカリ性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐有機薬品性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐湿性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
密着性	100	100	100	100	100	100
耐候性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
長期密着性	○	○	○	○	○	○
耐水性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐温水性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし

[0108]

[Table 4]

比較例	1	2	3
組成物	I-1	I-2	I-3
硬度	2H	2H	2H
紫外線吸収率	×	◎	×
透明性	◎	◎	◎
耐アルカリ性	異常なし	異常なし	異常なし
耐有機薬品性	異常なし	異常なし	異常なし
耐湿性	異常なし	異常なし	異常なし
密着性	100	100	100
耐候性	異常なし	異常なし	異常なし
長期密着性	×	×	×
耐水性	異常なし	異常なし	異常なし
耐温水性	異常なし	異常なし	異常なし

[0109] The examples 6-7 (composition of the photocatalyst content coating constituent for

glazing) of reference

Each ingredient (except a post-addition ingredient) of the kind and number of copies indicated to Table 5 could be added to the reflux condenser and the reaction machine equipped with the churning machine, and it agitated in them, and was made to react to them at 60 degrees C for 4 hours. Subsequently, it cooled to room temperature, the post-addition ingredient was added, and the constituent of 20% of solid content concentration was obtained. To 100 copies of obtained constituents, it is 100 copies of i-propyl alcohol. in addition, the jib after mixing well -- i-propyl alcohol solution (15% of solid content) of the reaction thing which consists of CHIRUSUZUJI acetate and silicate oligomer -- ten-copy addition -- it agitated well and photocatalyst content coating constituent (II-1) - (II-2) was obtained.

[0110] The examples 8-9 (composition of the silicone system coating constituent for glazing) of reference

Each ingredient (except a post-addition ingredient) of the kind and number of copies indicated to Table 5 could be added to the reaction machine equipped with the churning machine and the reflux condenser, and it agitated in it, and was made to react to it at 60 degrees C for 4 hours. Subsequently, it cooled to room temperature, the post-addition ingredient was added, and the constituent of about 40% of solid content concentration was obtained. It is 300 copies of i-propyl alcohol to 100 copies of obtained constituents. in addition, the jib after mixing well -- i-propyl alcohol solution (15% of solid content) of the reaction thing which consists of CHIRUSUZUJI acetate and silicate oligomer -- ten-copy addition -- it agitated well and silicone system coating constituent (II-3) - (II-4) was obtained.

[0111] The examples 10-11 (composition of the fluoride system coating constituent for glazing) of reference

After adding and agitating each ingredient (except water and a post-addition ingredient) of a kind and number of copies indicated to Table 5 in the reaction machine equipped with the churning machine and the reflux condenser, the water of number of copies given in Table 5 was dropped at it, and it was made to react to it at 60 degrees C under churning for 5 hours. Subsequently, it cooled to room temperature, ten copies of ASECHIRU acetone was back-added, and fluoride system coating constituent [of about 30% of solid content concentration] (II-5) - (II-6) was obtained.

[0112]

[Table 5]

参考例	6	7	8	9	10	11
組成物名称	II-1	II-2	II-3	II-4	II-5	II-6
配合処方 (部)						
メチルトリメトキシシラン	70	70	70	70	70	70
ジメチルジメトキシシラン	30	30	30	30	30	30
(b 2-1) 固形分 40%		50		50		
(b 3-1) 固形分 40%					50	
(b 3-2) 固形分 40%						50
光触媒 (水分散 TiO ₂) *5	250	350				
水					30	30
1-プロピルアルコール	70	100				
ジエチレングリコールモノエチ	70	100				
ルエーテル						
メチルイソブチルケトン					175	175
ジ-1-プロポキシ・エチルア	10	10	10	10	10	10
セトアセテートアルミニウム						
後添加成分						
アセチルアセトン	10	10	10	10	10	10

[0113] *5) 20% (20% of solid content) of an ANATAZE type titanium oxide content

On work examples 7-22, a comparative example 4 - the PET film surface of 50 micrometers of 9 film thickness It applied and the coating constituent for the coating under the composition indicated to Tables 6-9 was dried so that dryness film thickness might be set to 1 micrometer, and subsequently to 0.1 micrometer, it applied and dried so that dryness film thickness might become, and the coating constituent for glazing was used as the hardening object. Various evaluations were performed to the acquired hardening object. A result is collectively shown in Tables 6-9.

[0114]

[Table 6]

実施例	7	8	9	10	11	12
組成物						
下塗り	I-1	I-2	I-3	I-4	I-5	I-6
上塗り	II-1	II-1	II-1	II-1	II-1	II-1
評価結果						
耐アルカリ性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐有機薬品性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐湿性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
密着性	100	100	100	100	100	100
耐候性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
長期密着性	○	○	○	○	○	○
耐水性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐温水性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし

[0115]

[Table 7]

実施例	13	14	15	16	17	18
組成物						
下塗り	I-3	I-3	I-3	I-3	I-3	I-5
上塗り	II-2	II-3	II-4	II-5	II-6	II-2
評価結果						
耐アルカリ性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐有機薬品性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐湿性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
密着性	100	100	100	100	100	100
耐候性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
長期密着性	○	○	○	○	○	○
耐水性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐温水性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし

[0116]

[Table 8]

	実施例				比較例	
	1 9	2 0	2 1	2 2	4	5
組成物						
下塗り	I-5	I-5	I-5	I-5	—	—
上塗り	II-3	II-4	II-5	II-6	II-1	II-2
評価結果						
耐アルカリ性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐有機薬品性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
耐湿性	異常なし	異常なし	異常なし	異常なし	異常なし	異常なし
密着性	100	100	100	100	10	10
耐候性	異常なし	異常なし	異常なし	異常なし	部分剥離	部分剥離
長期密着性	○	○	○	○	×	×
耐水性	異常なし	異常なし	異常なし	異常なし	部分剥離	部分剥離
耐温水性	異常なし	異常なし	異常なし	異常なし	部分剥離	部分剥離

[0117]

[Table 9]

比較例	6	7	8	9
組成物				
下塗り用	—	—	—	—
上塗り用	II-3	II-4	II-5	II-6
評価結果				
耐アルカリ性	異常なし	異常なし	異常なし	異常なし
耐有機薬品性	異常なし	異常なし	異常なし	異常なし
耐湿性	異常なし	異常なし	異常なし	異常なし
密着性	100	100	100	100
耐候性	部分剥離	部分剥離	部分剥離	部分剥離
長期密着性	×	×	×	×
耐水性	部分剥離	部分剥離	部分剥離	部分剥離
耐温水性	部分剥離	部分剥離	部分剥離	部分剥離

[0118] Dryness film thickness should be set the coating constituent for bottom coating indicated in Table 10 and 11 to each base material indicated to 23 to work-example 49 Table 10 and 11 to 1 micrometer. It applied and dried, and it applied and dried so that dryness film thickness might be set to 0.1 micrometer, and the coating constituent for glazing subsequently to Table 10 and 11 indicated was used as the hardening object. Evaluation of adhesion nature and weatherability was performed to the acquired hardening object. A result is collectively shown in Table 10 and 11. In addition, the work example which uses two sorts of coating constituents for bottom coating did not mix a constituent, but prepared on the substrate the bottom coating layer which consists of a double layer of 1 micrometer of film thickness.

[0119]

[Table 10]

実施例	基材	コーティング組成物		評価	
		下塗り	上塗り	密着性	耐候性
23	PC板(2mm厚)	I-3	II-1	100	異常なし
24	PC板(2mm厚)	I-3	II-4	100	異常なし
25	PC板(2mm厚)	I-3	II-5	100	異常なし
26	PC板(2mm厚)	I-5	II-2	100	異常なし
27	PMMA板(2mm厚)	I-3	II-1	100	異常なし
28	PMMA板(2mm厚)	I-3	II-4	100	異常なし
29	PMMA板(2mm厚)	I-3	II-5	100	異常なし
30	PMMA板(2mm厚)	I-5	II-2	100	異常なし
31	アクリルフィルム (50 μ m厚)	I-3	II-1	100	異常なし
32	アクリルフィルム (50 μ m厚)	I-3	II-4	100	異常なし
33	アクリルフィルム (50 μ m厚)	I-3	II-5	100	異常なし
34	アクリルフィルム (50 μ m厚)	I-5	II-2	100	異常なし
35	ABS 板	I-3	II-1	100	異常なし
36	ABS 板	I-3	II-4	100	異常なし
37	ABS 板	I-3	II-5	100	異常なし
38	ABS 板	I-5	II-2	100	異常なし

[0120]

[Table 11]

実施例	基材	コーティング組成物		評価	
		下塗り	上塗り	密着性	耐候性
39	軟質アルミ板A1050P	エポキシ樹脂/I-3	II-1	100	異常なし
40	軟質アルミ板A1050P	エポキシ樹脂/I-3	II-4	100	異常なし
41	軟質アルミ板A1050P	エポキシ樹脂/I-3	II-5	100	異常なし
42	軟質アルミ板A1050P	エポキシ樹脂/I-5	II-2	100	異常なし
43	鋼板 (防錆処理)	I-4	II-1	100	異常なし
44	SUS304 (メッキ加工)	I-4	II-1	100	異常なし
45	無機窯業系基系基材	エポキシ樹脂/I-5	II-2	100	異常なし
46	発泡コンクリート (ALC)	エポキシ樹脂/I-5	II-2	100	異常なし
47	タイル	I-4	II-6	100	異常なし
48	ガラス	I-4	II-6	100	異常なし
49	木材	ポリエステルエマ ルジョン/I-3	II-6	100	異常なし

[0121]

[Effect of the Invention] Especially the coating constituent of this invention can give the long-term adhesion nature and weatherability of a base material and various paints including a photocatalyst content paint, a silicone system paint, and a fluoride system paint by using as an object for bottom coating.

[Translation done.]